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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,192	02/12/2004	Torbjorn Sandstrom	2674-000003/US/COA	2748
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HARNESSE, DICKEY & PIERCE, P.L.C. P.O. BOX 8910 RESTON, VA 20195			EXAMINER CHOI, WILLIAM C	
			ART UNIT 2873	PAPER NUMBER

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/776,192

Applicant(s)

SANDSTROM, TORBJORN

Examiner

William C. Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.


- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


Loha Ben
Primary Examiner

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2004 & 2 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/623,195.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 5 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In regard to the claims, the language claiming the broad limitation of a laser light source and the narrower limitation of an excimer laser light source within the same claim leads to confusion over the intended scope of each claim, thereby rendering the claims vague and indefinite. For purposes of examination, the claims were interpreted to disclose the limitation of the excimer laser light source.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 17-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Suzuki (U.S. 6,268,906 B1).

In regard to claim 17, Suzuki discloses an apparatus for creating a pattern on a photosensitive workpiece (column 3, lines 8-15, Figure 1), comprising: a light source for

emitting light flashes in the wavelength range from EUV to IR (column 5, lines 53-54 and column 2, lines 9-16, Figure 1, "1"), a projection system for directing the emitted light to the workpiece (column 6, lines 22-27, Figure 1, "15"), and a control system arranged to control a trigger signal to the light source for emitting the light flashes, wherein the trigger signal is controlled in order to compensate for flash-to-flash time jitter in said light source (column 7, lines 16-27).

Regarding claim 18, Suzuki discloses wherein the electronic control system is arranged to control the timing of the trigger signal (column 7, lines 16-27).

Regarding claim 19, Suzuki discloses wherein the electronic control system is arranged to control a time offset of the trigger signal (column 7, lines 16-27, Figure 2).

Regarding claim 20, Suzuki discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposure (column 7, lines 16-27, Figure 2).

In regard to claim 21, Suzuki discloses a method for creating a pattern on a workpiece sensitive to light radiation (column 3, lines 8-15, Figure 1), comprising: emitting light flashes in the wavelength range from EUV to IR (column 5, lines 53-54 and column 2, lines 9-16, Figure 1, "1"), projecting the emitted light on the workpiece (column 6, lines 22-27, Figure 1, "15"), controlling a trigger signal for emitting the light flashes in order to compensate for flash-to-flash time jitter (column 7, lines 16-27).

Regarding claim 22, Suzuki discloses wherein the controlling of the trigger signal involves controlling of the timing of the trigger signal (column 7, lines 16-27).

Regarding claim 23, Suzuki discloses wherein a time offset of the trigger signal is controlled (column 7, lines 16-27, Figure 2).

Regarding claim 24, Suzuki discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposures (column 7, lines 16-27, Figure 2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of Nelson (U.S. 5,523,193).

In regard to claim 1, Suzuki discloses an apparatus for creating a pattern on a workpiece sensitive to light radiation (column 3, lines 8-15, Figure 1), comprising: a light source for emitting light flashes in the wavelength range from EUV to IR (column 5, lines 53-54 and column 2, lines 9-16, Figure 1, "1"), a projection system creating an image of the modulator on the workpiece (column 6, lines 22-27, Figure 1, "15"), an electronic control system controlling the intensity of the radiation, so that said pattern is printed on the workpiece, wherein said electronic control system is further arranged to control a trigger signal to the light source for emitting the light flashes, said trigger signal being controlled in order to compensate for flash-to-flash time jitter in said light source

(column 7, lines 16-27, Figure 1, "13"), an electronic data processing and delivery system receiving a digital description of the pattern to be written (column 6, line 64 – column 7, line 15), a precision mechanical system for positioning said workpiece and/or projection system relative to each other (column 6, lines 56-63, Figure 1, "17"), wherein the control system controls the position of the workpiece (column 6, lines 56-63), but does not specifically disclose a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation, an electronic data processing and delivery system converting said pattern to modulator signals, and feeding said signals to the modulator, and wherein the control system feeds the signals to the modulator.

Within the same field of endeavor, Nelson teaches that it is desirable to implement a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation (column 3, lines 61-66, Figure 2, "50"), an electronic data processing and delivery system converting said pattern to modulator signals, and feeding said signals to the modulator (column 3, lines 66-67 and column 4, line 57 – column 5, line 6, Figure 2, "52"), and wherein the control system would inherently feed the signals to the modulator, in place of a mask system (Figure 1, i.e. as disclosed in Suzuki), for the purpose of reducing cost of mask fabrication and for faster production time of workpieces (column 2, lines 9-37 and column 3, line 52 – column 5, line 21, Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of Suzuki to comprise the claimed components since Nelson teaches that it is desirable to do so for

the purpose of reducing cost of mask fabrication and for faster production time of workpieces.

Regarding claim 2, Suzuki further discloses wherein the electronic control system is arranged to control the timing of the trigger signal (column 7, lines 16-27).

Regarding claim 3, Suzuki discloses wherein the electronic control system is arranged to control a time offset of the trigger signal (column 7, lines 16-27, Figure 2).

Regarding claim 4, Suzuki discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposure (column 7, lines 16-27, Figure 2).

Regarding claim 5, Suzuki discloses whereby the light source is a laser, and preferably an excimer laser (column 2, lines 9-10).

Regarding claim 6, Suzuki discloses where the pattern is formed in photoresist (column 1, lines 30-36).

In regard to claim 7, Suzuki discloses a method for creating a pattern on a workpiece sensitive to light radiation (column 3, lines 8-15, Figure 1), comprising: emitting light flashes in the wavelength range from EUV to IR (column 5, lines 53-54 and column 2, lines 9-16, Figure 1, "1"), controlling the emitted radiation so that said pattern is printed on the workpiece, wherein controlling of the emitted radiation involves controlling of a trigger signal for emitting the light flashes in order to compensate for flash-to-flash time jitter (column 7, lines 16-27, Figure 1, "13"), but does not specifically disclose modulating the emitted light with a spatial light modulator (SLM) having a multitude of modulating elements (pixels), projecting an image of the modulator on

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the workpiece and controlling the modulator and the positioning of the workpiece in relation to the projected image, based on a digital description of the pattern to be written, so that said pattern is printed on the workpiece.

Within the same field of endeavor, Nelson teaches that it is desirable to modulate the emitted light with a spatial light modulator (SLM) having a multitude of modulating elements (pixels) (column 3, lines 61-66, Figure 2, "50"), projecting an image of the modulator on the workpiece (column 4, lines 1-5) and controlling the modulator and the positioning of the workpiece in relation to the projected image, based on a digital description of the pattern to be written, so that said pattern is printed on the workpiece (column 4, line 57 – column 5, line 6), for the purpose of reducing cost of mask fabrication and for faster production time of workpieces (column 2, lines 9-37 and column 3, line 52 – column 5, line 21, Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the method of Suzuki to comprise the claimed limitations since Nelson teaches that it is desirable to do so for the purpose of reducing cost of mask fabrication and for faster production time of workpieces.

Regarding claim 8, Suzuki further discloses wherein the controlling of the trigger signal involves controlling of the timing of the trigger signal (column 7, lines 16-27).

Regarding claim 9, Suzuki discloses wherein a time offset of the trigger signal is controlled (column 7, lines 16-27, Figure 2).

Regarding claim 10, Suzuki discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposures (column 7, lines 16-27, Figure 2).

In regard to claim 11, Suzuki discloses an apparatus workpiece sensitive a light source for creating a pattern on a workpiece sensitive to light radiation (column 3, lines 8-15, Figure 1), comprising: a light source for emitting light flashes in the wavelength range from EUV to IR (column 5, lines 53-54 and column 2, lines 9-16, Figure 1, "1"), a projection system for creating an image of the modulator on the workpiece (column 6, lines 22-27, Figure 1, "15"), and an electronic control system controlling the intensity of the radiation, in accordance with an intended pattern to be printed and further arranged to control a trigger signal to the light source for emitting the light flashes in order to compensate for flash-to-flash time jitter in said light source (column 7, lines 16-27, Figure 1, "13"), but does not specifically disclose a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation and an electronic control system controlling the position of the image created on the workpiece and the modulation elements of the modulator.

Within the same field of endeavor, Nelson teaches that it is desirable to implement a spatial light modulator (SLM) having a multitude of modulating elements (pixels), adapted to being illuminated by said radiation (column 3, lines 61-66, Figure 2, "50"), an electronic data processing and delivery system receiving a digital description of the pattern to be written, converting said pattern to modulator signals, and feeding said signals to the modulator (column 3, lines 66-67 and column 4, line 57 – column 5,

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line 6, Figure 2, "52"), in place of a mask system (Figure 1, i.e. as disclosed in Suzuki), for the purpose of reducing cost of mask fabrication and for faster production time of workpieces (column 2, lines 9-37 and column 3, line 52 – column 5, line 21, Figure 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the apparatus of Suzuki to comprise the claimed components since Nelson teaches that it is desirable to do so for the purpose of reducing cost of mask fabrication and for faster production time of workpieces.

Regarding claim 12, Suzuki further discloses wherein the electronic control system is arranged to control the timing of the trigger signal (column 7, lines 16-27).

Regarding claim 13, Suzuki discloses wherein the electronic control system is arranged to control a time offset of the trigger signal (column 7, lines 16-27, Figure 2).

Regarding claim 14, Suzuki discloses wherein the offset value is estimated based on a measured delay between a trigger signal and a resulting exposure for at least one of the latest exposure (column 7, lines 16-27, Figure 2).

Regarding claim 15, Suzuki discloses whereby the light source is a laser, and preferably an excimer laser (column 2, lines 9-10).

Regarding claim 16, Suzuki discloses where the pattern is formed in photoresist (column 1, lines 30-36).

Response to Arguments

Applicant's arguments with respect to claims 1-24 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (571) 272-2324. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W.C.
William Choi
Patent Examiner
Art Unit 2873
December 27, 2004


Loha Ben
Primary Examiner